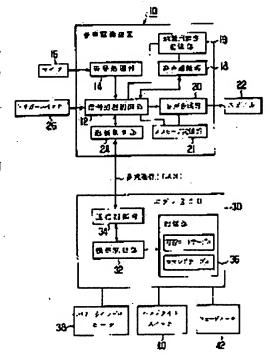# PATENT ABSTRACTS OF JAPAN

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(54) EQUIPMENT CONTROLLER WITH VOICE RECOGNIZING FUNCTION, AND VOICE RECOGNIZING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a device capable of suitably handling an inputted similar type command which is easy to misrecognize since it is similar to other commands as an equipment controller with voice recognizing function.

SOLUTION: A voice command that a user voices is recognized by a voice recognition part 18. When a similar type command is recognized, a body ECU 30 determines whether the command execution is allowed or inhibited according to current travel conditions. When the execution is inhibited, a talkback accelerating revoicing using a rephrasing command is made. When the execution is allowed, a talkback accelerating the use of the rephrasing command from a next chance is made. The use of the rephrasing command reduces misrecognition. Further, the similar type command can be executed as much as possible within a range that the travel conditions allow.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the equipment which can perform suitable control to the input of other voice commands and a similar similar type command especially about the appliance control equipment which has the function to recognize the voice command which the user uttered. Moreover, this invention relates to the voice recognition unit suitable for the above-mentioned appliance control equipment.

[0002]

[Description of the Prior Art] Hereafter, the electrical device of an automobile is taken up for an example and the background technique of this invention is explained. Conventionally, the actuation switch connected to electrical devices, such as a power window and a headlight, is installed in the vehicle interior of a room of an automobile, and the user was operating the electrical device using the actuation switch. However, to make actuation of an electrical device as easy as possible is desired so that a user can concentrate more to operation. In order to meet such a demand, it is thought effective to form a voice recognition unit. The device actuation by utterance of a voice command is attained, and improvement in operability is achieved.

[0003] A voice recognition unit is equipment which recognizes the voice which people uttered, and using a voice recognition unit as input units, such as various kinds of electronic equipment, is proposed. The voice which the user uttered is changed into digital data. "Voice" is a sentence, a word, an alphabetic character, a notation, a figure, etc. With an example, data processing using a cepstrum (cepustrum) is performed to digitized voice data, and it is recognized what the user said. The voice recognition unit is explained by "sound and voice engineering" (the Furui ****, Kindai Kagaku Sha, 174page-), for example.

[0004] In the present condition, since it is difficult to recognize voice correctly by 100% of probability, it is common knowledge to have a talk back function. A voice synthesizer is formed in a voice recognition unit. Recognition of voice generates and outputs the synthesized speech which shows a recognition result. A user gets to know a recognition result and a recognition result judges whether it is the right. And when the recognition result is mistaken, again, a user utters voice and inputs into recognition equipment. By such talk back function, a right recognition result is obtained certainly. The voice recognition unit equipped with the talk back function is indicated by JP,63-38996,A and JP,1-177192,A.

[0005]

[Problem(s) to be Solved by the Invention] Other commands and a similar command are in a voice command from a viewpoint of a speech recognition technique. This kind of command is hereafter called "similar type command." If the voice command for the switching action of the power window of a car is considered as an example, "it lowers" is similar in "It raises." Therefore, when voice "it raises" is uttered, a voice recognition unit may keep as the 1st candidate "it lowers." Thus, when a user utters a similar type command, possibility that the command will be recognized accidentally is high. It is necessary to avoid the unprepared device actuation in which the possibility of incorrect recognition originates in a high command if possible. It plans so that for that purpose, "resemblance type command" may not be used, and incorrect recognition is wanted to make it hard to happen.

[0006] Originally a similar type command is not suitable as a command for recognition. Then, it is desirable that other voice commands and the command which is not similar are set up as a command of the normal for recognition. However, a user does not always use a normal command with reference to a manual etc. Moreover, since the user of a certain automobile used the command currently usually used by its own car by others' car, a normal command may not be used. In such a case, if the command is not received at all but it is ignored when the command which is not a normal command is uttered, the facilities of the speech recognition function for a user will decrease. The similar type command which may be used by the user although it is not a normal command is also wanted to be accepted as widely as possible.

[0007] In addition, here explained use of a speech recognition technique paying attention to the electrical device of an automobile. However, in the case of an automobile, such a problem is not restricted, but may be generated in the equipment of the arbitration using a speech recognition technique.

[0008] This invention is made in view of the above-mentioned technical problem, and the purpose is in offering the appliance control equipment with a speech recognition function which can be responded [suitable] to the input of a similar type command.

[0009]

[Means for Solving the Problem] The appliance control equipment with a speech recognition function of this invention recognizes the voice command which the user uttered, and controls an object device according to the recognized voice command. This control unit performs cure processing for avoiding the unsuitable device actuation based on incorrect recognition, when it has a similar command storage means to memorize the high similar type command of possibility of being incorrect-recognized and said similar type command has been recognized, since it is similar with other voice commands. According to this invention, the similar type command which is [incorrect-] easy to recognize is memorized by the similar command storage means. Therefore, since it turns out that the recognized voice command is a similar type command, cure processing for avoiding the unsuitable device actuation at the time of the input of a similar type command can be performed.

[0010] This invention 1 voice preferably appliance control equipment [like] A speech synthesis means to perform speech synthesis for the talk back which tells a user about the recognition result of a voice command, A **** command storage means to be the voice command which directs the same device actuation as said similar type command, and to memorize other commands and the voice command which is not similar as a ****

command, It **** and the talk back to which it urges using a **** command instead of said similar type command as said cure processing is performed.

[0011] According to this mode, when the similar type command has been recognized, the talk back to which it urges using the **** command corresponding to that command is performed. Since other voice commands are not resembled, a **** command is [incorrect-] hard to be recognized. The user who heard this talk back performs voice input henceforth using a **** command. Thus, by the suitable talk back corresponding to the input of a similar type command, it can plan so that a similar type command may not be used as much as possible. Consequently, generating of incorrect recognition decreases, therefore the unprepared device actuation accompanying incorrect recognition can also be avoided.

[0012] Moreover, 1 voice, a control unit [like] has an environmental condition detection means to detect environmental condition with this invention for it to be desirable and another which has set said object device, and activation of the appliance control according to the recognized similar type command is forbidden or permitted as said cure processing according to the detected environmental condition. Environmental conditions are transit conditions (various kinds of conditions relevant to transit) in an automobile.

[0013] According to this mode, when a certain similar type command has been recognized, under a certain environmental condition, the device actuation according to that command is forbidden. However, even when the same command has been recognized, under an environmental condition with others, after taking safety etc. into consideration, device actuation is permitted, and, thereby, time and effort of reinput of a user can be lessened. Therefore, after preventing certainly the unsuitable device actuation under the detected environmental condition according to this mode, it can have executing a similar type command in the range which an environmental condition allows, and smoother device actuation and earlier device actuation can be enabled.

[0014] It has the still more desirable **** command storage means of the above-mentioned which remembers a **** command to be the speech synthesis means of the above-mentioned [the appliance control equipment of this mode] for the talk back. And the talk back to which the recurrence voice using said **** command is urged when activation of appliance control is forbidden is performed, and on the other hand, when activation of appliance control is permitted, the talk back to which it urges using said **** command from the following opportunity is performed. Thereby, performing appliance control according to an environmental condition, it can plan so that a similar type command may no longer be used for future.

[0015] Moreover, a similar command storage means for the voice recognition unit of this invention to be equipment which recognizes the voice command which the user uttered, and to memorize the high similar type command of possibility of being incorrect-recognized since it is similar with other voice commands, A **** command storage means to be the voice command which directs the same device actuation as said similar type command, and to memorize other commands and the voice command which is not similar as a **** command, When it has a speech synthesis means to perform speech synthesis for the talk back which tells a user about the recognition result of a voice command and said similar type command has been recognized, the talk back to which it urges using a **** command instead of said similar type command is performed.

[0016]

[Embodiment of the Invention] Hereafter, the gestalt (henceforth an operation gestalt) of suitable operation of this invention is explained with reference to a drawing. Drawing 1 is the block diagram with which this invention was applied and in which showing the control device of the electrical device of an automobile. The body ECU 30 controls those object devices by sending a control signal to a controlled-system slack electrical device. Here, closing motion of a power window and turning on and off of a headlight are controlled as an example. It connects with the body ECU 30 and the voice recognition unit 10 of this invention functions as an input unit of the body ECU 30.

[0017] The signal-processing control section 12 is formed in the voice recognition unit 10. The signal-processing control section 12 has CPU, and is controlling the equipment 10 whole. The acoustical-treatment section 14 is connected to the signal-processing control section 12, and the microphone 16 is connected to the acoustical-treatment section 14. The voice command which the user uttered is changed into an analog electrical signal with a microphone 16, and is inputted into the acoustical-treatment section 14. Voice data is changed into a digital signal in the acoustical-treatment section 14. Furthermore, in the acoustical-treatment section 14, data processing required for speech recognition is performed. For example, windowing-function processing and fourier transform processing are performed, and the cepstrum of voice data is called for. The voice data after processing is outputted to the signal-processing control section 12.

[0018] The trigger switch 26 is connected to the signal-processing control section 12. A trigger switch 26 is operated by the user. The signal-processing control section 12 will incorporate the data of the voice uttered after that via the acoustical-treatment section 14 from a microphone 16, if a trigger switch 26 is pushed.

[0019] As a modification, the so-called press talk switch may be formed instead of a trigger switch 26. The voice uttered while having continuing pushing a press talk switch is incorporated by the signal-processing control section 12 from a microphone 16. Moreover, a voice recognition unit 10 may always be recognition type equipment as another modification. Even if there is no actuation of a trigger switch and a press talk switch, the existence of utterance by the user is supervised and detected.

[0020] Moreover, the speech recognition section 18 is connected to the signal-processing control section 12. The signal-processing control section 12 sends the voice data incorporated from the acoustical-treatment section 14 to the speech recognition section 18. The speech recognition section 18 is so-called DSP and the so-called microcomputer, and analyzes the voice data which the user uttered. The standard voice data corresponding to the voice command for recognition is memorized by the dictionary storage section 19 for recognition. The speech recognition section 18 compares a user's voice data and standard voice data, and recognizes a user's voice command based on a comparison result.

[0021] In recognition processing, a recognition score is attached by comparing a user's voice data with each of two or more standard voice data prepared in the storage section 19. The similarity of both the data for a comparison is so high that a recognition score is high. The preliminary decision of the command corresponding to the standard voice data which gives the highest recognition score is carried out to it being the voice command which the user uttered. A recognition score is computed based on the distance of a user's voice data and standard voice data. This distance is computed from the determinant showing voice data. A recognition score is so high that distance is near, and both the data

compared are similar. Moreover, for example, a recognition score is computed based on likelihood using the probability technique. In order to determine likelihood, it is common knowledge to use a HIDON Markov model. A recognition score is so high that likelihood is high.

[0022] With this operation gestalt, the standard voice data of each voice command is memorized as follows by the dictionary storage section 19 for recognition about the voice command corresponding to each of two or more actuation of the device of a controlled system.;

"The aperture of a driver's seat is shut."

"The aperture of a driver's seat is opened."

"A headlight is turned on."

"A headlight is erased."

These voice commands are normal commands. Since the normal command is not similar with other commands (similarity is low), possibility of being incorrect-recognized as other commands is low. The similarity of two commands can be quantitatively evaluated using an above-mentioned distance and likelihood. For example, considering the distance between commands, as shown in the drawing 2 upper case, the distance of "opening" is separated in "It shuts." When a user says, "It shuts", a user's voice data is far from near and "opening" for "it shutting." Therefore, since the recognition score of "shutting" becomes high sharply from "it opens", a voice command is correctly recognized by the high probability.

[0023] Furthermore, with this operation gestalt, the standard voice data of the following voice command is memorized by the dictionary storage section 19 for recognition.;

"The aperture of a driver's seat is raised."

"The aperture of a driver's seat is lowered."

"Headlight-on"

"Headlight-off"

Although these voice commands also support two or more actuation of the device of a controlled system, respectively, these voice commands are irregular commands. Since the irregular command is similar with other commands, its possibility of being incorrect-recognized is high. As shown in the lower berth of drawing 2 , the distance of "lowering" is near in "it raising". [of standard voice data] When a user says, "It raises", a user's voice data is in the same distance from "it raising", and "it lowering". [of standard voice data] Therefore, since both recognition score also becomes near, the probability for incorrect recognition to occur is high. That is, a recognition result can become "lowering" even when a user says, "It raises."

[0024] Since the above irregular commands can cause incorrect recognition, not being used originally is desirable. Then, the user is recommended using a normal command by the manual. However, a user may use a speech recognition function, without seeing a manual. Moreover, the user who is using the automobile of other types of a car may use usually the automobile by which this operation gestalt was applied. In such a case, if it assumes that a user uses commands other than a normal command, it is not desirable to make it not receive at all the command which is not regular. Then, like the above, since commands other than normal are also permitted as much as possible, it is constituted so that an irregular command may also be recognized.

[0025] Since the above-mentioned irregular command resembles other commands,

possibility of becoming the cause of incorrect (similarity is high) recognition is high, and equivalent to the similar type command of this invention. On the other hand, since the normal command is not similar with other commands, its possibility of becoming the cause of incorrect recognition is low. It can be said that it is a dissimilar type command if a normal command is contrasted with the above-mentioned irregular command.

[0026] It is a command for directing the same device actuation that moreover, the above-mentioned normal command "the aperture of a driver's seat is shut" raises the aperture of an irregular bound command "driver's seat." Therefore, when it makes "to raise the aperture of a driver's seat" into the similar type command of this invention, "the aperture of a driver's seat is shut" is equivalent to the **** command of this invention. A **** command is a voice command which directs the same device actuation as a similar type command, and are other commands and a voice command which is not similar. It is the same also about "headlight-off" in a "headlight-on" "headlight being erased as "headlight "which lowers the aperture of a driver's seat" is turned on as 3 sets of other apertures of a command "driver's seat are opened""." Moreover, the dictionary storage section 19 for recognition is equivalent to the similar command storage means of this invention, and a **** command storage means so that more clearly than the above.

[0027] The recognition result of return and the speech recognition section 18 is sent to drawing 1 to the signal-processing control section 12. Thereby, the signal-processing control section 12 is understood what the user said. In addition, in the above-mentioned acoustical-treatment section 14 and the above-mentioned speech recognition section 18, speech recognition processing according to a well-known principle should just be performed. The different speech recognition technique from the above-mentioned example may be applied, and the speech recognition technique of arbitration can be applied to this operation gestalt.

[0028] Furthermore, the speech synthesis section 20 is connected to the signal-processing control section 12. According to directions of the signal-processing control section 12, the speech synthesis section 20 generates the synthesized speech of various messages. The message data memorized by the message storage section 21 is used for speech synthesis processing in the speech synthesis section 20. The generated synthesized speech is outputted from a loudspeaker 22, and is told to a user.

[0029] The speech synthesis section 20 generates the synthesized speech which requires audio utterance of a user. Moreover, the speech synthesis section 20 generates the synthesized speech for the talk backs. In talk back voice, the contents of the voice command recognized by the speech recognition section 18 are repeated. A user is shown the recognition result within equipment by the output of talk back voice.

[0030] Moreover, the signal-processing control section 12 performs data communication using in the car [LAN] between the bodies ECU 30 using the communications control section 24. With this operation gestalt, a speech recognition result is once sent to the body ECU 30 before the above-mentioned talk back. And message creation of the talk back is performed according to the directions from the body ECU 30.

[0031] Next, the body ECU 30 is explained. The appliance control section 32 which has CPU is formed in the body ECU 30. The appliance control section 32 performs data communication between the above-mentioned voice recognition units 10 using the communications control section 34. Moreover, the appliance control section 32 controls actuation of the power window and headlight which are the electrical device of a

controlled system by sending a control signal to the power-window motor 38 and the headlight switch 40. An aperture opens and closes by rotation of the motor according to a control signal, and a headlight lights up and puts out the light by turning on and off of a switch.

[0032] Moreover, the speedometer 42 is connected to the body ECU 30, and a speedometer 42 sends a car rate (vehicle speed) to the body ECU 30. The vehicle speed shows whether a car is running or it is under stop. The low vehicle speed run state below a predetermined rate may be included in a stop condition. Transit conditions, such as "transit" and "a stop", are equivalent to the environmental condition of this invention. An environmental condition is related with the environment where the controlled-system device which used the speech recognition result is set as mentioned above.

[0033] Furthermore, the body ECU 30 contains the clock and it judges whether the present is night based on time of day. An illuminance sensor may be formed for decision of being Nighttime. "Nighttime" is one of the transit conditions, and is equivalent to the environmental condition of this invention.

[0034] Moreover, the storage section 36 connected to the appliance control section 32 has memorized the propriety code table shown in drawing 3 , and the command table shown in drawing 4. The transit conditions on which activation of device actuation is permitted to every actuation propriety code (000-111), and the transit conditions forbidden are shown by the propriety code table. O The mark shows authorization and x mark shows prohibition. For example, also while running also during a stop, as for a code 000, Nighttime also shows that device actuation is forbidden. In a code 010, under a stop and Nighttime show that device actuation is permitted during transit, although device actuation is forbidden. As for a code 111, Nighttime shows that device actuation is permitted during a stop and transit.

[0035] Moreover, each voice command and the above-mentioned actuation propriety code are matched with the command table of drawing 4 . In addition, the transit conditions (it is the same as drawing 3) corresponding to the actuation propriety code attached to each command are also shown by drawing 4 as reference.

[0036] The appliance control section 32 grasps current transit conditions as mentioned above. The appliance control section 32 judges whether the device actuation corresponding to the command should be permitted, or it should forbid under current transit conditions, when a certain voice command is inputted with reference to transit conditions and two tables. For example, suppose that "the aperture of a driver's seat is lowered" has been sent from the voice recognition unit 10 during a stop. According to the actuation propriety code 010 attached to this command, as shown in drawing 3 , the command execution under stop should be forbidden.

[0037] The command table of drawing 4 is created from a viewpoint like as safety is kept more certain. For example, suppose that "the aperture of a driver's seat is raised" has been recognized. Since this command is an irregular command, recognition may be mistaken (possibly in fact, the user said, "the aperture of a driver's seat is lowered"). It is not desirable to shut an aperture according to the mistaken recognition, also while running also during a stop. Then, it receives "the aperture of a driver's seat is raised" and the actuation propriety code 001 is set up like illustration in order to forbid the actuation under these conditions. On the contrary, when "the aperture of a driver's seat is lowered" has been recognized according to incorrect recognition, it will be thought that an aperture

may be lowered if it is under stop. Then, it receives "the aperture of a driver's seat is lowered" and the actuation propriety code 101 is attached so that the device actuation under stop may be permitted. Moreover, it is not desirable that a headlight is switched off about a headlight for example, at Nighttime according to incorrect recognition. Then, to the irregular command "headlight-off", the actuation propriety code 110 is attached so that activation of device actuation of Nighttime may be forbidden.

[0038] In contrast with the setup of the actuation propriety code to the above irregular commands, the actuation propriety code 111 is attached by each to the normal command. Therefore, as far as three transit conditions in drawing are concerned, the device actuation corresponding to the recognized command is permitted under any transit conditions. It is because possibility of being incorrect-recognized is low, so the normal command has an unnecessary code setup in order to forbid device actuation in consideration of incorrect recognition generating.

[0039] In addition, as mentioned above, with this operation gestalt, although command execution is permitted based on an environmental condition, device actuation is not necessarily immediately performed after authorization decision. Device actuation is realized, after performing the suitable talk back to the user and taking the approval of a user so that it may mention later. Thereby, final prevention of incorrect recognition is achieved. This point is the same also about an irregular command also about a normal command.

[0040] Next, with reference to the flow chart of drawing 5, actuation of the appliance control equipment of this operation gestalt is explained. In order to operate a power window and a headlight, a user utters a voice command, after pushing a trigger switch 26 (S10). An irregular command can be used although it is desirable that a user uses a normal command. A voice command is inputted into a microphone 16 and the inputted voice command is recognized (S12). Here, the input signal of voice data is incorporated by the signal-processing control section 12 through data processing in the acoustical-treatment section 14. Voice data is sent to the speech recognition section 18 from the signal-processing control section 12. In the speech recognition section 18, a user's voice data is compared with the standard voice data memorized by the dictionary storage section 19 for recognition, and a recognition score is attached. The preliminary decision of the voice command corresponding to the standard voice data which gives the highest recognition score is carried out to it being the command inputted by the user.

[0041] The signal-processing control section 12 judges whether the recognition score corresponding to the voice command by which the preliminary decision was carried out is beyond a predetermined decision-criterion value (S14). This decision shows whether the voice command which the user uttered is one of the commands of a processing object (is it one of the commands memorized by the dictionary storage section 19 for recognition or not?). When the voice which is not related to device actuation is uttered, a high recognition score is not obtained. In such a case, the signal-processing control section 12 directs creation of the message of a recurrence voice demand to the speech synthesis section 20. The created message is outputted from a loudspeaker 22. Furthermore, according to directions of the signal-processing control section 12, a loudspeaker 22 outputs a beep sound (S16), and returns to S10. The user who heard the beep sound does the recurrence voice of the command according to a message. In addition, a thing including the guidance to which it urges using a right command as a

recurrence voice demand message preferably is used.

[0042] When S14 is YES, the signal-processing control section 12 sends the recognized voice command to the body ECU 30 using the communications control section 24. It is received by the communications control section 34 and a voice command is sent to the appliance control section 32. The appliance control section 32 judges first whether a voice command is a normal command with reference to the command table (drawing 4) memorized by the body ECU 30 (S18). As shown in drawing 4 , the actuation propriety code 111 is attached to the normal command. Therefore, about three transit conditions of drawing 3, activation of device actuation is always permitted. When S18 is YES, the appliance control section 32 directs to perform the Normal talk back to the signal-processing control section 12 of a voice recognition unit 10 (S20).

[0043] the Normal talk back -- "-- the aperture of "driver's seat is opened -- " -- it has recognized -- " -- as -- a recognition result is told. This message is generated by the speech synthesis section 20, and is outputted from a loudspeaker 22. It is judged after the talk back whether the user depressed the trigger switch 26 in the predetermined latency time (S22). A user pushes a trigger switch, when it thinks that the recognition result shown in a talk back message is mistaken. In this case, according to directions of the signal-processing control section 12, the message of a recurrence voice demand is generated by the speech synthesis section 20, and it is outputted from a loudspeaker 22. Furthermore, a beep sound is outputted (S24) and it returns to S10.

[0044] If a trigger switch is not pushed even if the predetermined latency time passes since the talk back in S22, that is told from the signal-processing control section 12 to the appliance control section 32. The appliance control section 32 executes the voice command recognized by S12 (S26). If a voice command is "opening the aperture of a driver's seat", the control signal which directs motor actuation to the power-window motor 38 will be outputted.

[0045] Next, actuation when the appliance control section 32 judges "the inputted voice command is not a normal command" in S18 is explained. In this case, the inputted voice command is an irregular command (namely, similar type command of this invention). In the above-mentioned S12, the voice command which gives the highest recognition score is elected. If an irregular command is used, the recognition score about two or more standard voice data will approach. Therefore, the recognition score about the command which a user has not uttered may become the highest. Thus, the following processings are performed in consideration of the possibility of incorrect recognition being high.

[0046] The command table of drawing 4 is referred to in S30, and the actuation propriety code corresponding to the recognized irregular command is read. Moreover, the detection result of current transit conditions is referred to. And it is judged from an actuation propriety code and transit conditions whether the device actuation corresponding to an irregular command should be permitted (S32). For example, suppose that the irregular command "the aperture of a driver's seat is lowered" was inputted. The actuation propriety code of this command is 101. As shown in the table of drawing 3 , if it is under stop now, device actuation will be permitted, but device actuation will be forbidden if it is under transit. Similarly, the actuation propriety code of "headlight-off" is 110. Therefore, if it is current Nighttime, device actuation will be forbidden, and device actuation will be permitted if it is not Nighttime.

[0047] When device actuation is forbidden by S32, the irregular talk back corresponding

to prohibition decision is performed (S34). Here, "prohibition of device actuation" is told from the appliance control section 32 to the signal-processing control section 12. The signal-processing control section 12 orders creation of the message for the following irregular talk backs to the speech synthesis section 20.

[0048] " "the aperture of a driver's seat is lowered" has been recognized. Since the sound of "raising" "to lower" is alike, there is possibility of incorrect recognition. Please restate "The aperture of a driver's seat is opened". "

This message is outputted from a loudspeaker 22, a beep sound is outputted further (S34), and it returns to S10. The user who heard the message restates "The aperture of a driver's seat is shut."

[0049] In addition to the usual talk back, the above-mentioned message is demanding the recurrence voice using a normal command. Device actuation is not performed without recurrence voice. Moreover, the normal command is used as a **** command of this invention. Thus, when decision of S32 is NO (prohibition), device actuation according to an irregular command is not performed, but is urged to the recurrence voice which used the **** command. In addition, the part of "..." of the message for the above-mentioned irregular talk backs is transposed to the applicable part of those messages, when other three irregular messages have been recognized. The same is said of the following message corresponding to authorization decision.

[0050] On the other hand, when device actuation is permitted by S32, the talk back corresponding to authorization decision is performed (S36). Here, "authorization of device actuation" is told from the appliance control section 32 to the signal-processing control section 12. The signal-processing control section 12 orders creation of the message for the following irregular talk backs to the speech synthesis section 20.

[0051] " "the aperture of a driver's seat is lowered" has been recognized. Since the sound of "raising" "to lower" is alike, there is possibility of incorrect recognition. Please say from next time, "The aperture of a driver's seat is opened". "

Unlike the message corresponding to prohibition decision, the message corresponding to authorization decision is not demanding this recurrence voice. It is because activation of device actuation is permitted, so it is not necessary to require a correction this time. Instead, the contents to which use of the normal command (**** command) from the following opportunity is urged are included.

[0052] The above-mentioned message is outputted from a loudspeaker 22 (S36), and it is judged whether the user depressed the trigger switch 26 in the predetermined latency time (S38). Like the processing about the Normal talk back, if a trigger switch 26 is pushed, a recurrence student demand message and a beep sound will be outputted (S40). If a trigger switch 26 is not pushed, that is told from the signal-processing control section 12 to the appliance control section 32. The appliance control section 32 executes the voice command recognized by S12. For example, if a voice command is "lowering the aperture of a driver's seat", the control signal which directs motor actuation to the power-window motor 38 will be outputted (S42).

[0053] In the above, the suitable operation gestalt of this invention was explained. When the irregular command equivalent to the similar type command of this invention is inputted according to this operation gestalt, after taking safety into consideration, device actuation is permitted or forbidden based on the transit conditions at that time (regulation). Device actuation always is not forbidden, but the device actuation which is

not desirable is forbidden, and device actuation is permitted in the range which transit conditions allow. In prohibition, a user is asked for the recurrence voice using a normal command. In authorization, a user does not need to perform recurrence voice and device actuation is realized after the talk back. Thus, after preventing unsuitable device actuation certainly, an irregular command can be executed in the satisfactory range and smoother device actuation and earlier device actuation can be enabled.

[0054] Moreover, with this operation gestalt, when the irregular command has been recognized, the message which stimulates use of the normal command as a **** command of this invention at the time of the talk back to a user is outputted. Also when activation of an irregular command is permitted, and also when forbidden, it is urged to use of a normal command (however, when it is authorization, urged to the use from the following opportunity). Therefore, it can plan so that the irregular command which is [incorrect-] easy to be recognized may not be used, and generating of incorrect recognition is reduced, and unprepared device actuation can be prevented as much as possible.

[0055] (1) Explain the modification of this operation gestalt. With this operation gestalt, one normal command and an irregular command are illustrated about one device actuation. However, a normal command and an irregular command may be plural. As other normal commands, it is possible "to raise the aperture of a driver's seat", and "the aperture of a driver's seat is downed", for example. Moreover, a command may be transformed in the range which can judge the contents of the command. For example, "it opens", "it shutting", "a rise", and "a down" are only sufficient. Moreover, the format of a command may be arbitrary and any, such as a sentence, a word, an alphabetic character, a notation, and a figure, are sufficient as it.

[0056] (2) Moreover, with this operation gestalt, when the normal command has been recognized, a normal command is once sent to the body ECU 30 from a voice recognition unit 10 before the talk back. This processing may be omitted in the modification. For example, the signal-processing control section 12 judges whether the voice command which the speech synthesis section 20 has recognized is a normal command. When it is a normal command, the signal-processing control section 12 directs the message generation for the Normal talk backs to the speech synthesis section 20. When the irregular command has been recognized, as explained using drawing 5 , a command is sent to the body ECU 30.

[0057] (3) By this operation gestalt, decision of authorization/prohibition of device actuation etc. was processed with the body ECU 30 further again. On the other hand, all of these processings are performed by the voice recognition unit 10 in this modification. That is, all steps other than device actuation within drawing 5 are performed by the voice recognition unit 10. And when there is no response of a user to the talk back S22 and S38, the command of a recognition result is sent to the body ECU 30. In addition, a voice recognition unit 10 is equipped with the actuation propriety code table of drawing 3 , or the command table of drawing 4 for this processing.

[0058] (4) With this operation gestalt, the normal command as a **** command was told to the user by the talk back. On the other hand, a **** command may be told to a user using other technique. For example, it is also suitable to display a **** command using a display etc.

[0059] (5) With this operation gestalt, this invention was applied to the control unit of the electrical device of an automobile. Of course, this invention may be applied to the control

unit of other devices. Moreover, as for the applicability of this invention, it is also needless to say that it is not restricted to an automobile.

[Translation done.]